Rice yield improvement by foliar application of phytohormone

ABSTRACT

The phytohormones perform a vital role for the plant growth and development. A study was conducted at glasshouse of Universiti Putra Malaysia to evaluate the different phytohormones foliar application on the yield of MR219 rice. Five treatments, namely control (distilled water) and commercial products, epibrassinolide, spermine and pyroligneous acid with three times of foliar applications, were evaluated in a randomized complete block design (RCBD) with four replicates. Phytohormones were applied at 45 DAS (tillering and booting stages), 65 DAS (active tillering, booting stages) and 95 DAS (active tillering, booting and heading stages) during planting period. Application of different phytohormone produced the highest plant height, tillers hill-1, root length, root surface area, root volume, chlorophyll contents, leaf area, dry biomass, photosynthesis rate and stomata conductance compared to traditional practice in MR219 rice. The highest grain number (139 panicle-1), panicle (19 hill-1), grain weight (50.87 hill-1) and grain filling (95%) were increased by pyroligneous acid, commercial products, epibrassinolide and spermine, respectively. However, there was no significant difference in yield recorded by the number of foliar phytohormone sprays. A single spray after 45 DAS proved better and economical compared to others. Due to application of phytohormones, the additional cost was increased in commercial products, 4.6%, epibrassinolide, 889%, spermine 4.2% and pyroligneous acid 3.8% for three times application. Thus, in terms of cost benefit, spermine in a single spray proved economic and potential phytohormone for the rice yield improvement.

Keyword: Application; Commercial products; Epibrassinolide; Spermine; Pyroligneous acid